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ABSTRACT

The mother of a 3-year-old girl who showed "autistic-like" behavior was cued via a FM wireless microphone to systematically approve and disapprove of her child's behavior. After baselines were taken on two categories of problem behavior (Pre-Academic and Social Behavior) the social contingencies were applied successively to each category. The Pre-Academic task was quickly established in the child when the mother applied these social contingencies. This result was replicated with requests for social interaction. In the final phase, cueing was withdrawn from both situations and the mother was able to maintain the child's improved behavior. An analysis of the mother's behavior suggested that her increased use of social punishment for inappropriate behavior was the key factor in the child's increasing responsiveness. Follow-up seven months later indicated that the improvements maintained. (Author)

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SOCIAL PUNISHMENT IN THE MODIFICATION OF A PRE-SCHOOL CHILD'S "AUTISTIC-LIKE" BEHAVIOR WITH MOTHER AS THERAPIST

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The mother of a 3-year-old girl who showed "autistic-like" behavior was cued via a FM wireless microphone to systematically approve and disapprove of her child's behavior. After baselines were taken on two categories of problem behavior (Pre-Academic and Social Behavior) the social contingencies were applied successively to each category. The Pre-Academic task was quickly established in the child when the mother applied these social contingencies. This result was replicated with requests for social interaction. In the final phase, cueing was withdrawn from both situations and the mother was able to maintain the child's improved behavior. An analysis of the mother's behavior suggested that her increased use of social punishment for inappropriate behavior was the key factor in the child's increasing responsiveness. Follow-up seven months later indicated that the improvements maintained.

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SOCIAL PUNISHMENT IN THE MODIFICATION OF A PRE-SCHOOL CHILD'S "AUTISTIC-LIKE" BEHAVIOR WITH MOTHER AS THERAPIST

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The analysis and modification of child behavior has become an area of great concern in recent years, as witnessed by the increasing amount of applied research being reported. Of particular interest has been the study of severely disturbed young children who have been labeled "autistic" or "schizophrenic" (Lovaas, Schaeffer, and Simmons, 1965a; Lovaas, Freitag, Gold, and Kassorla, 1965b) since their behavior is often so severely deviant as to require institutionalization. The research with these children has revealed several important facts regarding treatment: 1) The severest behaviors such as head banging, biting the hands and arms and other forms of self-injurious behavior appear to be based and are apparently maintained by various forms of social reinforcement; 2) Extinction can be used to reduce the behavior but is long in producing any effect; 3) Various forms of punishment (slapping, hitting, electric shock) are quite effective in eliminating the behavior; 4) Social or edible reinforcement for incompatible behavior is often helpful but is rarely sufficient to modify severely deviant behavior. The necessity for the use of aversive control in the form of punishment has been repeatedly demonstrated (Risley, 1968; Birnbrauer, 1968; Lovaas and Simmons, 1969), but has most often taken the form of physical punishment (e.g., slapping the buttocks) or electric shock.

Research with less deviant child populations has also increased at a prodigious rate and has demonstrated the importance of contingent social approval as a major factor in shaping and maintaining desirable behavior in children (Allen, Hart, Buell, Harris, and Wolf, 1964; Harris, Johnston, Kelley, and Wolf 1964; Johnston, Kelley, Harris, and Wolf, 1966; Baer and Wolf, 1968).

It has become increasingly clear that if changes in a child's behavior are to be maintained the significant adults, usually parents, must be systematically trained to cope with these behaviors and another field of research has presented us with an emerging technology for doing so (Patterson and Brodsky, 1966; Patterson and Gullion, 1968; Patterson, Ray, and Shaw, 1968; Risley and Wolf, 1966). This research has caused parent-child interactions to be analyzed in fine detail for clues as to the factors which maintain disturbed relations (Wahler, Winkel, Peterson, and Morrison, 1965; Bernal, Durgee, Pruett, and Burns, 1968; Wahler, 1969).

The purpose of the present research was to examine the interaction of a mother with her "autistic-like" child to discover a method of training the mother to modify the child's socially withdrawing and non-compliant behavior.

METHOD

Subject

The subject was a 3-year-old girl, referred to the Human Development Clinic at Florida State University. Because of her multiple "unnatural" behaviors, an inter-disciplinary evaluation was initiated by speech therapists, an audiologist, and a psychologist. All three areas reported, independently, that the subject's behavior was too erratic and maladaptive for formal evaluations to be made. These consistent reports occurred despite a great deal of effort on the part of the professionals in each of the specialized fields

to complete standardized formal testing. For example, the audiologist worked with the subject in daily one hour sessions for over two weeks in an attempt to condition her to respond to auditory stimuli.

The subject rejected all auditory cues, including sudden noises such as clapping or knocking on a door, and frequently stared with a blank expression on her face when presented with visual stimuli. The psychologist was reluctant to label her with a diagnostic category, but stated her behaviors were most like the behaviors of children typically diagnosed by other professionals as "autistic". For example, she would not play with other children, spent much time in repetitive, self-stimulating, and self-abusive behaviors (including hitting herself with her fists, biting herself, and scratching herself). Other undesirable behaviors reported by the mother included the subject's not being toilet trained (despite considerable efforts to train her), her low degree of cooperative behavior, her apathy and general non-responsiveness, her frequent and severe tantrums, and her refusal to comply with parental requests. The mother described the subject's response to strangers as being a "blank, expressionless stare" and that she frequently smiled in a "peculiar" fashion that was not "natural". Verbalizations were very infrequent, yet the mother reported that the subject had a large vocabulary which included such words as "apricot", "hippopotamus", and "airplane". The mother expressed her fears that these "unnatural" behaviors of her daughter meant that she was "mentally retarded" and/or "autistic".

Pre-Academic behaviors and Social behaviors were the specific behaviors of the subject that were modified. The choice of these behaviors was based on the information provided by the mother in an interview and after three sessions of observing the child and the mother together in a play therapy room

at the clinic. All of the tasks were behaviors the mother stated had "occurred at least once" in the past, but which the child would refuse to carry out most of the time.

The Pre-Academic tasks were: 1) Stack this block (E points to a block) on top of this block; 2) Place a ring on the stick; 3) Put this ring (E points to a specific ring) on the stick; 4) Take a ring off of the stick; 5) Put this piece (E points to a specific piece) on the puzzle; 6) Stack a block on top of another block; 7) Place the rings on the shelf; 8) Lay the books on the shelf; 9) Put the cup on the shelf; 10) Take this block (E points to a specific block) off of this block; 11) Place a block on the shelf; 12) Put this block (E points to a specific block) on the shelf; 13) Sit on the chair (E points to a specific chair); 14) Put your chair next to the table, and; 15) Sit on the chair.

The Social requests were: 1) Say "Hi!"; 2) Do this (E claps hands); 3) Smile at me; 4) Come to me (E holds arms outstretched); 5) Hold my hand (E holds out hand); 6) Sit on my lap; 7) Look at me; 8) Do this (E points to his nose); 9) Hug my neck; 10) Pull your chair over and sit beside me; 11) Wave to me (E waves to the subject); 12) Say "Thank you!"; 13) Give me a kiss on the cheek; 14) Play patty-cake with me (E holds out hands), and; 15) Say "Good-bye!".

Observers, Behavior Definitions, and Observation System

The observers were undergraduate juniors and seniors, trained in techniques of observation. The observers were divided into two groups, one group served as observers of the subject and the second group served as observers of the mother and the experimenter.

The subject's observers recorded her behaviors on specially designed

observation forms using the following definitions as their criteria:

A. PRE-ACADEMIC BEHAVIORS: completions with 30 seconds of special motor tasks assigned by the adult interacting with the subject.

B. SOCIAL BEHAVIORS: completion within 30 seconds of the specific social tasks assigned by the adult interacting with the subject.

Observers of the mother and the experimenter recorded their behaviors using the following definitions as their criteria:

A. APPROVING BEHAVIORS: defined as any verbalizations (e.g., "That's good!", "I am proud of you".) or physical interactions (e.g., hugs and kisses) which clearly are intended to show acceptance of the subject's behavior.

B. DISAPPROVING BEHAVIORS: defined as any negative verbalizations (e.g., "That's bad!", "Don't do that".) or physical interactions (e.g., withdrawal of attention, withdrawal of physical contact, spanking) which clearly are intended to discourage subject's behavior.

Both sets of observers were positioned in an observation room adjacent to the experimental room and scored the specified behaviors in their respective categories. They scored each specific behavior in any 10 second interval in which it occurred, but any specific behavior continuing into the next interval was scored once per interval until it terminated. Thus, behaviors were recorded in continuous 10 second intervals. One observer recorded the subject's behaviors and one recorded the adult's behaviors during each session.

Reliability checks were obtained by having a second observer from each group periodically make a simultaneous but independent observation record. Agreement on any specific behavior of the subject or the adults was checked interval-by-interval. The percentage of agreement of the record was calculated by dividing the number of agreements by the number of agreements plus disagreements multiplied by 100 to yield the percentage of inter-observer reliability.

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Setting and General Procedure

Experimental sessions were typically held four days a week at the Human Development Clinic. The experimental room, which was 3.3 x 3.9 x 3.0 meters,

had a large one-way mirror on one wall permitting observation and video-taping from an adjacent room. The experimental room contained three chairs, a low table, an empty bookshelf, selected age-appropriate toys, an electric wall clock with a sweep second hand, and a chart listing the tasks given to the subject.

The research technique used was a single-subject multiple baseline design (Baer, Wolf, and Risley, 1968; Hall, Cristler, Cranston, and Tucker, 1970). The experimental design consisted of three conditions: Baseline, Cueing, and No Cueing. During the first condition, baselines on Compliance and Social behavior were obtained for the subject and the use of approvals and disapprovals by the mother and the experimenter were also gathered. The experimenter was trained in the use of behavior modification procedures with children and consistently applied social reinforcers and punishers in his interaction with the child throughout the experiment. This was done to demonstrate the differential effects of contingencies of reinforcement. Any approximation to the completion of a task was immediately reinforced by his saying, "That's just great, you did what I asked you to do!", as he hugged the child. If the child did not initiate a task within the time allotted (30 seconds) the experimenter would immediately say, "No! You're not doing what I asked you to do!" as he withdrew from the child.

The Compliance tasks consisted of the 15 requests for the subject to manipulate her physical environment; the Social tasks were the 15 requests to interact with the mother or experimenter in specific ways.

The Baseline condition was followed by Cueing, which consisted of the mother being cued by the experimenter in the systematic application of social approval and disapproval techniques that he had been using. Following the baseline periods, the mother was first cued for 15 sessions when she was

working with her daughter on Compliance tasks. The portion of the session which focused on the subject's Social behaviors served as a control for the possibility of some outside variable or the mere passage of time accounting for the change in the Compliance behavior.

After a consistent rate of Compliance behavior was achieved, the cueing was discontinued for this behavior and the mother was then cued in the use of approval and disapproval for the Social behavior. This condition of the study was continued until a stable rate of behavior was achieved. Cueing was finally withdrawn from the Social behavior as well.

The mother did not directly observe any of the experimenter's interactions with the subject during the sessions of the study, rather she was asked to wait in the clinic reception room during these periods of time. Further, she was not "taught" behavioral principles before the experimental manipulations had been accomplished, as has been done in previous studies in which the parent has served as a therapist (e.g., Wahler, 1969). Rather, the only instructions she was given were: 1) to request the child to carry out the specific tasks on cue; 2) to follow the specific cues when given, and; 3) to otherwise deal with her daughter as she normally would. This procedure varied only during the experimental treatment conditions in which the mother was cued by the experimenter.

Cueing Method and Apparatus

After the baselines were taken the mother was cued by the experimenter from an adjoining room and/or the observation room. The remote cueing equipment consisted of a Channel Master FM Wireless Microphone (Model #64-33) and a Sony Automatic Tuning FM Radio (Model #2FA-24W) with an earplug. The FM radio was suspended from the mother's neck in a necklace-type apparatus.

The earplug precluded the subject's hearing the experimenter cueing the mother. Cueing from the adjoining room, rather than the observation room was done to decrease the possibility of biasing the observer's recordings.

The cueing consisted of precise instructions to the mother. That is, she was told when to give the subject a task, when to praise her, and when to punish her. This was accomplished by instructing her in the specific verbal and motor behaviors that she would use. For example, the mother was told, "Tell her (the subject) to put a block on top of another block." Then following the subject's successful completion of the task "Now, tell her 'That's good!' and give her a hug." If the mother erred in completing the reinforcement or the punishment, the instructions were repeated.

The experimenter monitored what transpired in the experimental room by using closed circuit television equipment. This consisted of the following components: Sony Video Camera (Model #CVC 2100A), Sony Videorecorder (Model #CV-2000), and Sony Video Monitor (Model #CVM 51UWP).

Specific Daily Procedure

Each full session, which lasted 36 minutes, was divided into four separate parts of nine minutes each. The mother and the experimenter alternated working with the subject in every other part. For example, the first segment of one session consisted of the mother interacting with the subject for nine minutes. This segment focused on the 15 Compliance tasks.

The next nine minutes were devoted to the experimenter interacting with the child on the same 15 tasks. This was followed by the mother working with her daughter on the 15 Social behaviors. Although the child had not demonstrated previously the ability to perform all of these behaviors at an appropriate time, all were reported as having been exhibited at least once

by the child. The daily session concluded with the experimenter working with the child on these same 15 behaviors.

The mother and the experimenter alternated their order of interacting with the subject on every other session. Also, the two categories of tasks were alternated. That is, the Compliance tasks were given to the child first and followed by the Social tasks on one day's session, then the session the following day started with the Social behavior tasks.

Home Observations

To determine if any behavior changes observed in the clinic would generalize to the home, observers were sent to the child's home on 25 occassions. The observers were instructed to use the same definitions of adult behavior and child behavior as used in the clinic. The parents were given no specific instructions except to "act as you normally do" and "please ignore the observers when they come."

RESULTS

Reliability

The study ran for 53 sessions and reliability checks were taken during 34 of these sessions and covering each experimental phase. Included in these checks were 20 checks on reliability of the definitions for the child's behavior and 27 checks of the adult's behaviors. Table 1 presents the data on the reliabilities that were taken. As shown here, the range of reliabilities was from 76% to 100% and only one of the eight mean reliabilities fell below 90%.

Table 1 about here

Baseline

Baseline was carried out for 21 sessions. As shown by the solid line in the top graph of Fig. 1, after some initial instability, the subject followed the Compliance requests only 40% of the time with the mother (solid line) while she would carry out over 80% of the same tasks with the E (dashed line). At the same time, the subject was carrying out less than 20% of the Social tasks with the mother, (as shown by the solid line in the bottom of Fig. 1), but would complete over 40% (dashed line) of the Social tasks with the experimenter.

Figure 1 about here

Cueing

The cueing procedure was begun on Session 22 for the Compliance tasks and continued for 14 sessions while the Baseline was continued for the Social requests. As shown in Fig. 1, cueing the mother to approve of Compliance behavior and disapprove of Non-Compliance, raised the child's rate to the same level of success as the Experimenter almost immediately, and steadily climbed until the subject was completing almost 90% of the Compliance tasks for the mother. A small improvement (less than 10%) on the Compliance tasks was also seen for the Experimenter during this time.

For the 14 sessions that the mother was used for the Compliance tasks she was given no instructions regarding the Social tasks, and the rate of following Social requests remained virtually unchanged, averaging less than 20%.

Starting with session 37, the mother was no longer cued during the Compliance tasks, but was instead cued during the Social segment of the session. As shown in the bottom half of Fig. 1, when the mother was cued to praise appropriate Social behavior and disapprove of inappropriate behavior, the subject's rate rose steadily to over 50%. The dashed line in the bottom half of Fig. 1 shows that the subject's rate of Social behavior with the Experimenter rose to 70% during this time.

No Cueing

Although cueing had been discontinued for Compliance behaviors after session 36, the rate maintained at about 80% with the mother. Cueing was dropped from Social behavior for the last six sessions and the rate for the mother dropped only slightly to about 50%. During this time, the rate with the mother on Compliance tasks was virtually unchanged.

Follow-up

The child and mother were brought back to the clinic one month, five months, and seven months after the last session to determine the degree to which the mother was able to maintain control over the child. Fig. 1 shows that the gains made were extremely stable and in fact that some additional gains were made in the Social behaviors. Seven months after the last treatment session, the child responded to the mother's request for Social behavior 93% of the time, (e.g., 14 out of 15 of the requests). This latter improvement may be due to the fact that the child entered speech therapy one month after the end of the study and began attending a pre-school about five months after the end of the study.

Analysis of Mother's Behavior

An analysis of changes in the mother's behavior as the result of cueing was carried out. This was done by determining whether, after any given request for either a Compliance or Social behavior, the mother reinforced a correct response or punished an incorrect response (or no response at all). If the mother did not reinforce a correct response when it occurred, or gave a Social approval or praise statement when the child did not follow a request, the interval was scored as a Reinforcement Error. If the mother did not punish the child for a failure to respond, or gave a punisher when the child was behaving appropriately, the interval was scored as a Punishment Error. A detailed view of the day-to-day changes in the mother's behavior is shown in Fig. 2. Punishment errors occurred at about 80% for the first few sessions of both conditions, then dropped to about 30% during the Pre-Academic condition and to about 60% for the Social condition, during the last week of baseline. When she was cued in the contingent use of reinforcement and punishment, her punishment errors dropped to less than 10% in five sessions while they continued at a high rate during the Social condition. When cueing was given during the Social condition, punishment errors dropped from 70% to less than 10% in five days. Punishment error rate remained low in the no-cueing phase for both Pre-Academic and Social conditions.

Table 2 presents a comparison of mean percent of reinforcement and punishment error rates for both the mother and the experimenter for all phases of the study. During the baseline, the mother made very few reinforcement errors (2% Pre-Academic and 1% Social) and this rate remained virtually unchanged over experimental conditions. That is, the mother was, from the outset, consistent in her use of Social reinforcement. The factor which appeared to be responsible for the changes in the child's behavior was a

drastic reduction in her punishment error rate, which is portrayed in Fig. 2. For comparison, the experimenter's error rate is also presented in Table 2. As shown here, reinforcement and punishment error rates for the experimenter were low throughout all conditions for both Pre-Academic and Social behavior.

Table 2 about here

Figure 2 about here

DISCUSSION

This study has shown that a significant change in an "Autistic-like" child's behavior could be achieved by changing the manner in which her mother interacted with her. By using a "bug-in-the-ear" type of cueing device, the mother was given specific ways of handling her child's socially withdrawn and uncooperative behavior. An analysis of the mother's behavior shows that it was her improved use of punishment (reduction in punishment errors) that was primarily responsible for the change in the child's behavior.

The study is significant in showing that such control can be gained in a short period of time with the consistent use of Social contingencies alone. During baseline, the child would complete a Pre-Academic task about 40% of the time, after cueing the mother, the child would comply over 90% of the time. Although similar effects were achieved with Social requests, the improvement was less dramatic. Initially the child would follow a Social request about 15% of the time and this rose over threefold to 50% when the mother was cued. The language requests ("Say Hi", "Say Thank you", "Say Good-bye") were largely responsible for the success not being greater

since it was this class which even the experimenter could not get the girl to emit. (The child would only follow about 70% of the Social requests with the experimenter, the remaining 30% almost always consisted of the language requests plus one or two other requests.)

Previous research has shown that parents can be taught to manage their children's deviant behavior (Hawkins, Peterson, Schweid, and Bijou, 1966; Risley, 1968; Wahler, 1969) but a precise day-to-day measure of the parent's behavior has been lacking. In the present study it was shown through a comparison of the experimenter's and mother's behavior that she needed to provide more negative consequences when the child did not follow a request. Previous research in parent training has not distinguished between Reinforcement Error and Punishment Error. The distinction was critical in this case since the mother's Reinforcement Error rate was extremely low to begin with. When the mother's behavior changed and her Punishment Error rate dropped as a result of the cueing, the child responded a much greater percentage of the time. Follow-up checks made as much as seven months after the study indicate that the mother's control has persisted.

Home Observations

Data based on home observations were inconsistent with the reports of previous investigators. Some of the prior research (e.g., Zeilberger, Sampen, and Sloane, 1968) conducted in homes appear to have had much greater success or to have been based on very general behavioral definitions. In the present study it was virtually impossible to enter the home for observations and obtain what would appear to be a representative sample of normal interaction within the family. This was true throughout the 25 home observations that were taken. Of the 25 observations, 18 were made of the child in the

company of the parents (the other seven were in a play situation with another child) at various times during the day. The most notable feature of these observations was that the parents never appeared to adapt to the observers and therefore never interacted "normally". This was noted by the observers and commented upon on several occasions by the mother. She stated that she knew she was not "acting normally" when the observers were there. This is contrary to the reports of previous research (e.g. Wahler, 1969; Zielberger et al, 1968) in which uncontaminated observations were apparently easily made. It would seem from other research (Surratt, Ulrich, and Hawkins, 1969) that observers can have an effect which may make such observations less reliable. The authors have no way of knowing if the mother generalized from the clinic when the observers were not present. Further research into conditions affecting "real-life" observations are no doubt needed before the data collected in such settings can be evaluated.

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FOOTNOTES

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FIGURE CAPTIONS

Figure 1. The percents of the subject's Compliance behavior and Social behavior with her mother and the experimenter during each training session. Solid line indicates mother; dashed line indicates experimenter. In the cueing condition, the mother was given precise instructions. That is, she was told via the cueing device when to give the subject a task, when to praise her, and when to punish her. In the follow-up sessions at 1 and 7 months the mother and the experimenter worked with the subject, but only the mother worked with the sbuject at the five month follow-up. Note that the subject's performance of tasks with the mother and experimenter was the same for Compliance in the 1 month follow-up and for Compliance and Social behavior at the 7 month follow-up session.

Figure 2. The percents of Punishment Errors of the mother for Compliance and Social behaviors of the subject under baseline, cueing, non-cueing, and follow-up conditions. Data was taken on the mother on the 1 month and 7 month follow-up sessions, but not on the 5 month follow-up session. The mother made 0% errors in Compliance during the follow-up.

TABLE 1

Range and Means of Reliability Checks on the

Subject, Mother and Experimenter

Person Observed	During Compliance			During Social	
	No. Checks	Range	Mean	Range	Mean
Subject (with Mother)	20	83-100%	92.60%	76-100%	91.85%
Subject (with Experimenter)	20	80-100%	93.75%	87-100%	95.00%
Mother	27	80-98%	90-78%	83-100%	91.15%
Experimenter	27	80-98%	89.63%	81-98%	90.63%

TABLE 2

Mean percent of Reinforcement and Punishment Errors by Mother and Experimenter in each of the experimental conditions

PUNISHMENT ERROR

	BASELINE		CUEING COMPLIANCE		CUEING SOCIAL		NO CUEING	
	Mother	Experimenter	Mother	Experimenter	Mother	Experimenter	Mother	Experimenter
Compliance	43%	12%	6%	00%	1%	1%	2%	00%
Social	61%	3%	62%	2%	6%	1%	17%	1%

REINFORCEMENT ERROR

	BASELINE		CUEING COMPLIANCE		CUEING SOCIAL		NO CUEING	
	Mother	Experimenter	Mother	Experimenter	Mother	Experimenter	Mother	Experimenter
Compliance	2%	2%	2%	2%	00%	1%	00%	00%
Social	1%	16%	3%	3%	1%	1%	1%	00%

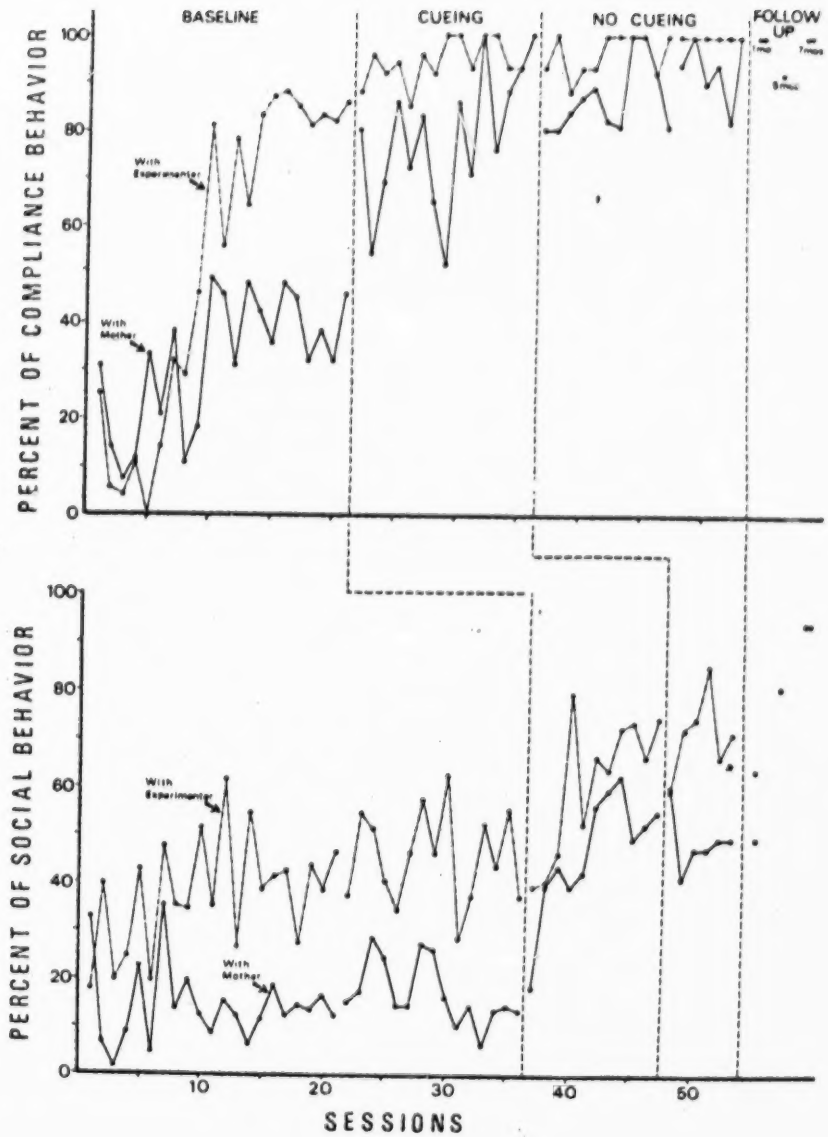
BASELINE
CUEING
NO CUEING
FOLLOW UP
PERCENT OF COMPLIANCE BEHAVIOR
With Experimenter
With Mother
PERCENT OF SOCIAL BEHAVIOR
With Experimenter
With Mother
0
20
40
60
80
100
10
20
30
40
50
SESSIONS

FIGURE 1

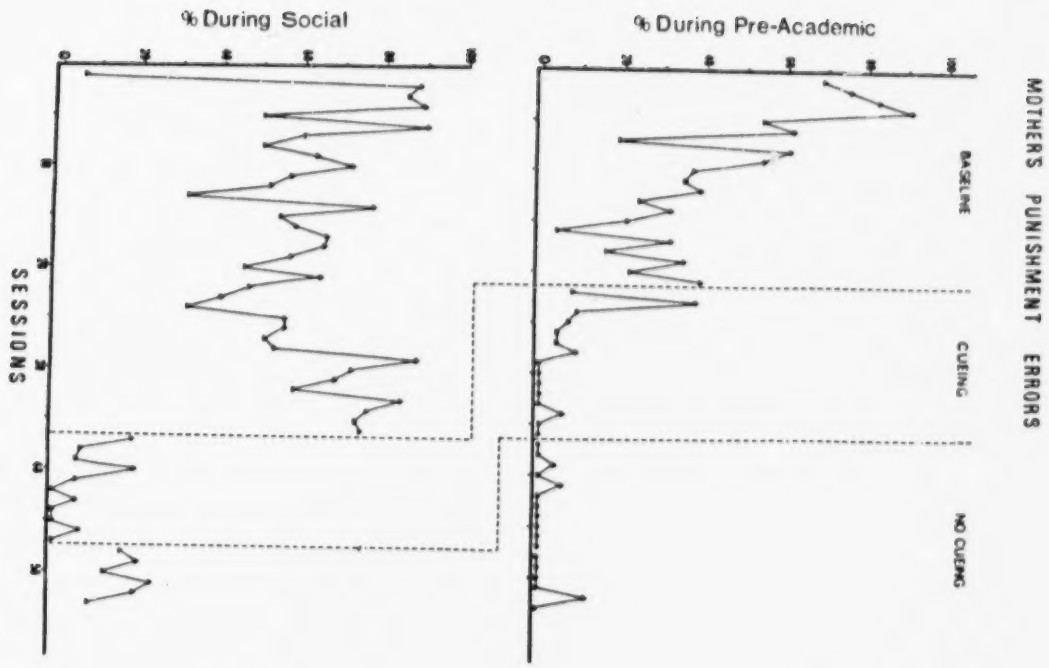
% During Social
% During Pre-Academic
SESSIONS
BASELINE
CUEING
NO CUEING
MOTHER'S PUNISHMENT ERRORS

FIGURE 2